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THE DEVELOPMENT OF INTERNATIONAL STANDARD CURRICULUM INTERACTIVE CHEMISTRY E-BOOK ON ACIDS, BASES AND SALTS TOPIC AT GRADE VII OF SMP

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ABSTRACK

The purpose of this research measures the validity of interactive chemistry e-book on international standard curriculum acids, bases and salts topic. This research use 4-D models that are developed by Thiagarajan which is limited at development stage. The e-book is proper to use as learning resource that validity average is 92,04% and student response average is 94%.

Keyword: *chemistry e-book, 4D models, validity, student response*

ABSTRAK

Tujuan dari penelitian ini adalah untuk mengetahui kelayakan *e-book* kimia interaktif mengacu pada kurikulum bertaraf internasional pada materi asam, basa, dan, garam. *E-book* ini dikembangkan dengan 4D *models* yang dikemukakan oleh Thiagarajan dengan dibatasi hingga pada tahap *develop*. *E-book* ini layak digunakan sebagai sumber belajar untuk SMP kelas VII dengan validasi sebesar 92,04% dan dengan hasil rata-rata respon siswa sebesar 94%.

Kata kunci: *e-book* kimia, model 4D, validasi, respon siswa

INTRODUCTION

The research about e-book is conducted by researchers such as The Development of Interactive E-Book on Acid Base at Grade XI by DiyaH [1]. The topic in e-book is intended for senior high school student and the curriculum used is KTSP. Moreover there are multiple choice questions. Other research is The Development of Interactive E-Book on Acids, Bases and Salts Topic by Kurnia [2]. The topic in this e-book is intended for junior high school and the curriculum used is KTSP and there are multiple choice questions. The research is intended for RSBI and SBI such as The Development of Interactive E-Book Bilingual on Thermochemistry Topic at Grade XI for RSBI Student by Muhamad [3]. The topic is intended for senior high school student with integrated curriculum between KTSP and Cambridge and use bilingual language. Moreover there is research about The Development of Bilingual E-Book on Introduction to Chemistry Topic by Enggar [4]. The topic is intended for junior high school student with integrated curriculum between KTSP and Cambridge then the language is bilingual. Both of researchers use multiple choice questions.

Based on the fact the limited e-book use English on chemistry topic for junior high school then in this opportunity the researcher make e-book use English that integrate KTSP and Cambridge on acids, bases and salts for junior high school. Questions in e-book are not multiple

choice but essay, so the student just do not choose but to train the understanding that has been owned.

Researcher add discovery lab feature to train understanding concept of student according to continuum of learning theories concrete-abstract by Bruner (1966) is a learning theory according to which a sequence of concrete experiences to abstract thinking [5]. In addition there is also the task of summarizing for students so that students can build an understanding based on experience that has been obtained according to the constructivist theory of learning [6].

METHODS

This research is the development of the 4-D (four D models) suggested by Thiagarajan [7] which include: the definition stage (Define), design stage (Design), development stage (Development), disseminate stage. This research is limited to the development stage. Objective of this research is the validity of international curriculum interactive chemistry e-book on acids bases and salts at grade VII of junior high school is analyzed descriptively.

RESULT AND ANALYSIS

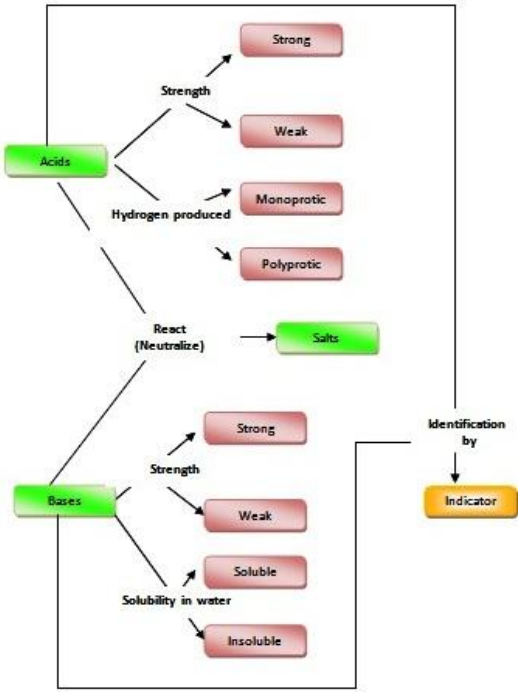
At the define stage the front end of the analytical results obtained in the form of indicators and objectives learning have been integrated between KTSP and Cambridge. The result is shown at table 1:

Table 1 Standart competence, Basic competence , Indicator and Objective learning for interactive e-book on acids bases and salts topic

Standard Competence	Basic Competence	Indicators	Objectives
.			Students are able to :
1. Understand classification of substances	Classify properties of acid, base and salt by using appropriate indicator.	1. Describe the meaning of term acid and alkali.	1. Describe the meanings of the terms acid and alkali.
		2. Describe how to test hydrogen ion concentration and hence relative acidity.	2. Describe how to test hydrogen ion concentration and hence relative acidity.
		3. Describe characteristic properties of acid in reaction with metals, bases and carbonates.	3. Describe the characteristic properties of acids when react with metals, bases and carbonates.
		4. Describe qualitatively the difference between strong and weak acids.	4. Describe qualitatively the difference between strong and weak acids.
		5. Describe the techniques use in the preparation of salt.	5. Describe the techniques used in the preparation of salts.

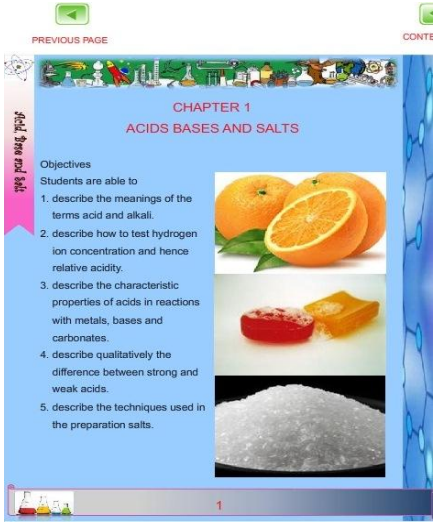
In the analysis of data showed that students who conducted research in SMPN 1 Purwoharjo have KKM (minimum completeness criteria) 75. The number of students who serve as subjects in this research is 12 and taken at random. Later in the task analysis is described about the tasks performed by students include: first of all the students were told to turn on the computer, then open the adobe flash software, then open an interactive e-book, students are given the opportunity to learn the e-book, then carry out practical work in accordance with the

practice instructions in the e-book, and the last students make a summary of the e-book that has been studied. In the analysis of the concept of design concepts that will be the reference material for students as summarized in the concept map below.

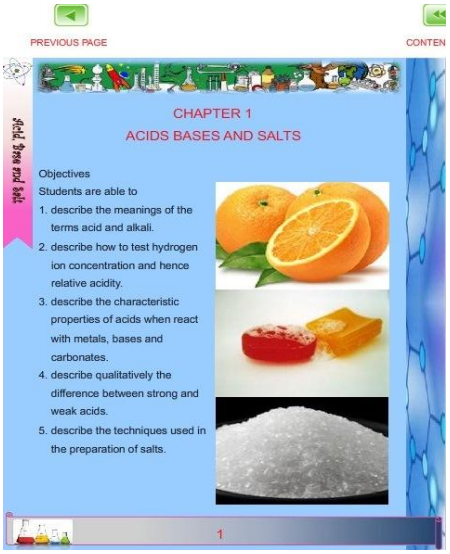


Picture 1 Concept Map of Acids, Bases and Salts

At the design stage has been done designing a customized e-book with the indicators that have been integrated. Preparation of e-book is set in some parts of the opener, content, and cover. The opening e-book is composed of the outer cover, the cover, introduction, and table of contents. Part of the contents of e-book is made up of indicators, concept maps, and content (acids, bases, salts, and indicators) are equipped with pictures and video. At the close of the e-book consists of exercises to test knowledge of students, practice exercises to train the understanding of student concept, the task of summarizing the material, and references. At the development stage of the study results obtained in the form of improved e-book all aspects of the content, media, and language. For the content, phase addition of a substance contained in all chemical reactions, for the media do change the video size becomes larger, and for language repairs a few words or phrases that mean the contents easily conveyed to the students. Here is a picture improvement done in e-book.



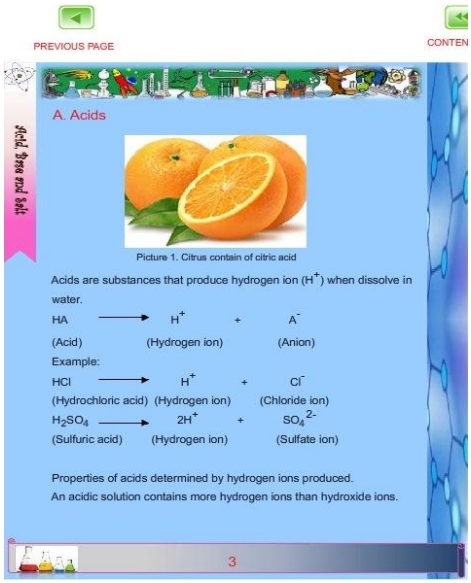
Picture 2 Indicators before revision



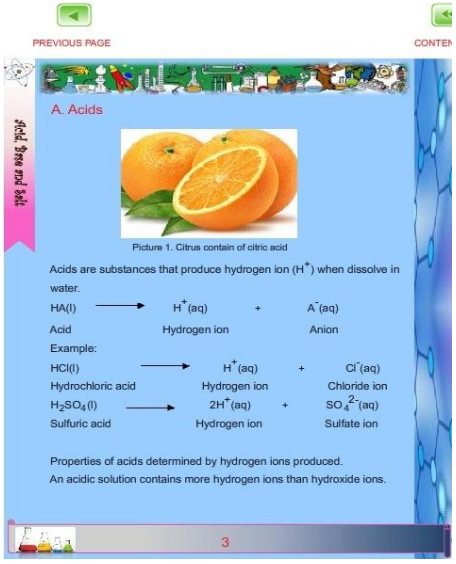
Picture 3 Indicators after revision

Indicators of learning in the third and fourth points have repairs to the structure of English. In all chemical reactions are

listed in the e-book description of the phase corrected with the addition of substances like the image below.



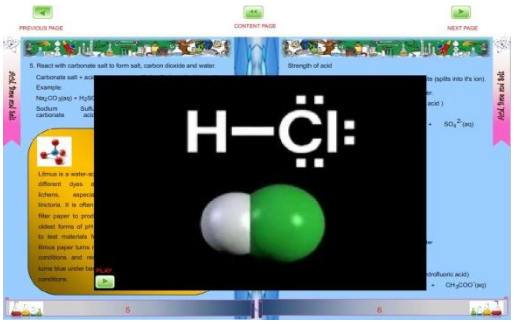
Picture 4 Chemical reaction before revision



Picture 5 Chemical reaction before revision

On display there are videos in which improvements need to enlarge the size of the current in the play button.

Picture 6 Video before revision



Picture 7 Video after revision

After examined and repaired interactive e-book was then performed to test the student sample to get the response from students. Then e-book validated by lecturers and teachers, validation test results by lecturer and teacher can be seen in the table below.

Table 2 Result of validation e-book content of Acid, Base and Salt Topic

No	Criteria	Assesment percent-tage	Category
1	Content	88,89%	Very feasible
2.	Presentation	90,39%	Very feasible
3.	Illustration	91,67%	Very feasible
4.	Language	97,22%	Very feasible
	Rates	92,04%	**Very feasible**

Based on the validation result table e-book can be seen that according to the scores interpretation of all aspects have been considered very feasible (81% - 100%).

CONCLUSION

Based on the results of research and analysis, it can be concluded that the media interactive e-book with the international standard curriculum on Acids, Bases and Salts is proper to use as a learning resource for junior high or SBI RSBI. This is supported by the results of validation for the content of 88.89%, 90.39% for the presentation, illustration of 91.67%, and the language of 97.22% with an average of 92.04% and the validation of the students with an average response average of 94% are classified as very good.

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